Remarks

Reconsideration of this Application is respectfully requested. Upon entry of the foregoing Amendment to the Claims, claims 1-27 are pending in the application, of which claims 1, 13, 20, and 24 are independent. By the foregoing Amendment, claims 19-23 are sought to be amended. No new matter is embraced by this amendment and its entry is respectfully requested. Based on the above Amendment and the remarks set forth below, it is respectfully requested that the Examiner reconsider and withdraw all outstanding rejections.

Rejection under 35 U.S.C. §101

The Examiner, on page 2 of the Office Action, has rejected claims 20-23 under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter. Specifically, the Examiner states that the subject matter of claims 20-23, which comprises a machine-accessible medium, does not produce a tangible result since the medium is not necessarily part of a computer. As the Examiner has suggested, Applicants have changed the preamble to read "An article comprising a computer-readable medium having associated data, wherein the medium causes a computer to perform the following." Applicants respectfully request that the Examiner consider the amended claims and withdraw this rejection.

Rejection under 35 U.S.C. § 102

The Examiner, on page 3 of the Office Action, states that claims 1, 4, 6-7, 9-13, 15, 17-20, 22-24, 26, and 27 are rejected under 35 U.S.C. § 102(e) as being anticipated

by U.S. Patent No. 6,757,811 to Mukherjee. Applicants respectfully traverse this rejection. Based on the remarks set forth below, Applicants respectfully request that this rejection be reconsidered and withdrawn.

To anticipate a claim of a pending application, a single reference must disclose each and every element of the claimed invention. *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1397 (Fed. Cir. 1986). The exclusion of a claimed element from the single source is enough to negate anticipation by that reference. *Atlas Powder Co. v. E.I. du Pont de Nemours & Co.*, 750 F.2d 1569, 1574 (Fed. Cir. 1984).

With respect to independent claim 1, the Examiner states that Mukherjee teaches every element of Applicants' claimed invention. Applicants respectfully disagree.

Contrary to the present invention, Mukherjee does not teach or suggest every element of Applicants' invention. For example, referring to independent claim 1, Mukherjee does not teach or suggest at least the following claimed element of "a data value prediction module coupled to the second pipeline."

Mukherjee appears to teach a simultaneous and redundantly threaded, pipelined process that executes the same set of instructions as two separate threads to provide fault tolerance. Unlike the present invention, which uses a data value prediction module to predict the load value in the second pipeline, Mukherjee teaches creating a slack between the two threads to enable a cache miss in the leading thread (which is referred to as the second pipeline in the present invention) to be resolved prior to the corresponding instruction being fetched and processed through the pipeline in the trailing thread. *Mukherjee*, col. 4, lines 11-34; col. 7, lines 52-67. With Mukherjee, a cache miss processed in the leading thread eliminates a corresponding cache miss in the trailing

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thread by storing the requested data in the cache during processing of the leading thread. *Id.* In fact, Mukherjee teaches away from Applicants' element of "a data value prediction module coupled to the second pipeline" because Mukherjee allows the leading thread to resolve the cache miss so that the corresponding instructions in the trailing thread will not experience the cache miss. Thus, with Mukherjee there is no need to have a data value prediction module.

For at least these reasons, Applicants respectfully submit that Mukherjee does not include each and every element of Applicants' claimed invention as recited in independent claim 1. Independent claim 13 recites similar elements to claim 1. Therefore, independent claims 1 and 13, and the claims that depend therefrom (claims 2-12 and 14-19, respectively), are patentable over Mukherjee.

With regards to claim 20, Mukherjee does not teach or suggest at least the following element of "calculating a predicted load value for execution of the LOAD instruction if a cache miss in the data cache results when the second pipeline executes the LOAD instruction before the first pipeline." Unlike the present invention, which supplies a predicted value for the load value instead of an actual value retrieved from memory, Mukherjee does not need to predict a load value because Mukherjee actually resolves the cache miss with the leading thread by retrieving the actual value from memory and storing it in the cache so that the corresponding instructions in the trailing thread will not experience the cache miss.

Thus, for at least these reasons, Applicants respectfully submit that Mukherjee does not include each and every element of Applicants' claimed invention as recited in independent claim 20. Independent claim 24 includes similar elements to claim 20.

Therefore, independent claims 20 and 24, and the claims that depend therefrom (claims 21-23 and 25-27, respectively), are patentable over Mukherjee.

Applicants respectfully request that the Examiner reconsider claims 1, 13, 20, and 24, and the claims that depend therefrom, and withdrawal this rejection.

Rejection under 35 U.S.C. § 103

The Examiner, on page 10 of the Office Action, states that claims 2-3, 5, and 14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,757,811 to Mukherjee. Applicants respectfully traverse this rejection. Based on the remarks set forth below, Applicants respectfully request that this rejection be reconsidered and withdrawn.

Claims 2-3 and 5 depend from independent claim 1, which is patentable over Mukherjee for at least the reasons stated above. Applicants therefore respectfully request that the Examiner reconsider and withdraw the rejection of dependent claims 2-3 and 5.

Claim 14 depends from independent claim 13, which is patentable over Mukherjee for at least the reasons stated above. Applicants therefore respectfully request that the Examiner reconsider and withdraw the rejection of dependent claim 14.

The Examiner, on page 12 of the Office Action, states that claims 8, 16, 21, and 25 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,757,811 to Mukherjhee in view of "Improving CC-NUMA Performance using Instruction-based Prediction," by Kaxiras *et al.* (hereinafter referred to as "Kaxiras"). Applicants respectfully traverse this rejection. Based on the remarks set forth below, Applicants respectfully request that this rejection be reconsidered and withdrawn.

Claim 8 depends from independent claim 1, which is patentable over Mukherjee for at least the reasons stated above. Applicants therefore respectfully request that the Examiner reconsider and withdraw the rejection of dependent claim 8.

Claim 16 depends from independent claim 13, which is patentable over Mukherjee for at least the reasons stated above. Applicants therefore respectfully request that the Examiner reconsider and withdraw the rejection of dependent claim 16.

Claim 21 depends from independent claim 20, which is patentable over Mukherjee for at least the reasons stated above. Applicants therefore respectfully request that the Examiner reconsider and withdraw the rejection of dependent claim 21.

Claim 25 depends from independent claim 24, which is patentable over Mukherjee for at least the reasons stated above. Applicants therefore respectfully request that the Examiner reconsider and withdraw the rejection of dependent claim 25.

Further, the M.P.E.P. states that "[t]he Examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the Examiner does not produce a *prima facie* case, the Applicant is under no obligation to submit evidence of nonobviousness." M.P.E.P. § 2142, page 2100-123.

Applicants respectfully assert that the obviousness rejection is improper because the Examiner has not established a *prima facie* case of obviousness. "To establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves, or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings." M.P.E.P. § 2141, page 124. Applicant asserts that there is no suggestion or motivation in the references themselves or in the knowledge of one skilled in the art, to modify the reference or to

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combine reference teachings. As indicated above, Mukherjee does not need to predict a load value because Mukherjee actually resolves the cache miss with the leading thread by retrieving the actual value from memory and storing it in the cache so that the corresponding instructions in the trailing thread will not experience the cache miss. Thus, for at least these reasons, Applicants assert that Mukherjee does not suggest being combined with Kaxiras. Therefore, this obviousness rejection is improper.

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Conclusion

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all currently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Response is respectfully requested.

Respectfully submitted,

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CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below

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